ConnectX™ IB MDI Dual-Port InfiniBand Mezzanine Card for Dell PowerEdge M600 and M605 Blades User's Manual

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Rev 1.0

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ConnectX IB MDI Dual-Port InfiniBand Mezzanine Card for Dell PowerEdge M600 and M605 Blades

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Revision History

This document was first printed on 12/21/07.

Table 1- Revision History Table

Date	Rev	Comments/Changes
Dec 2007	1.0	Initial Release

About this Manual

This *User's Manual* describes ConnectX IB MDI Dual Port InfiniBand mezzanine card for Dell PowerEdge M600 and M605 Blades.

It provides details as to the interfaces of the board, specifications, required software and firmware for operating the card, and relevant documentation.

Intended Audience

This manual is intended for the installer and user of the mezzanine card listed in "Overview" on page 5.

The manual assumes basic familiarity with the Infiniband™ architecture specifications.

Related Documentation

Table 2 - Documents List

InfiniBand™ Architecture Specification Volume 1 Release 1.2 and Volume 2 release 1.2.1– Infiniband Architecture Specifications Descriptions
PCI Express Base 2.0 Specification (1.1 compatible)
PCI Local Bus Specification Rev 2.3

Online Resources

- Mellanox Technologies Web pages: http://www.mellanox.com
- Dell Support Web pages: http://support.dell.com

Document Conventions

When discussing memory sizes, MB and MBytes are used in this document to mean size in mega bytes. The use of Mb or Mbits (small b) indicates size in mega bits.

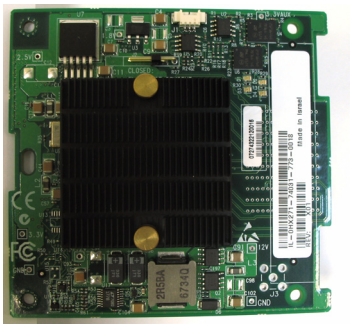
1 Overview

This document is a *User's Manual* for the MDI dual port mezzanine card based on the MT25408 ConnectX™ IB DDR InfiniBand integrated circuit device. The card described in this manual (see Table 3, on page 5) has the following main features:

- IBTA v1.2 compliant
- Compliant to the PCI Express 2.0 specification backwards compatible with PCI Express 1.1
- EU Restriction of Hazardous Substances (RoHS-R5) compliant

1.1 Mezzanine Card

Table 3- ConnectX IB MDI InfiniBand Mezzanine card details

Ordering Part Number (OPN)	Infiniband Link Speed	RoHS Compliance	Mezzanine Card Photo
ConnectX IB MDI	20 Gb/s	RoHS-R5 (with exemption)	

2 Dell Card Installation

2.1 Hardware and Software Requirements

Before installing the IB Mezzanine card, please make sure that the system meets the hardware and software requirements listed in Table 4.

Table 4- Hardware and Software Requirements

Requirement	Description
Hardware	Used with Dell PowerEdge M600 and M605 Blades
Software Operating Systems/Distributions	Refer to the PowerEdge M600 and M605 Blade Manuals

2.2 Installation Instructions

Follow the instructions in the *Installation Guide for ConnectX IB MDI Mezzanine Adapter Card for Dell PowerEdge M600 and M605 Blades.*

2.2.1 Safety Warnings

Over-temperature

The card should not be operated in an area with an ambient temperature exceeding the maximum recommended temperature of 55°C.

During Lightning

During periods of lightning activity, do not work on the equipment or connect or disconnect cables.

Equipment Disposal

Disposal of this equipment should be in accordance to all national laws and regulations.

3 Driver Software and Firmware

3.1 Driver Software

Refer to the documentation included with the Cisco M SFS7000E InfiniBand (IB) Primary Switch for directions to get the latest drivers for the mezzanine card.

3.2 Updating the Mezzanine Card Firmware

The mezzanine card is shipped with the latest version of qualified firmware at the time of manufacturing. Firmware is updated occasionally, and the most recent firmware can be obtained from http://www.mellanox.com/support/firmware_table_Dell.php.

Firmware can be updated on a single card using the mstflint tool included in the OFED distribution. In the directory that holds the latest firmware, run the following commands:

lspci | grep Mellanox ;identifies PCI ID to be used in next command

mstflint -d <PCI ID, for example 05:00.0> -i <.bin file>b

4 Mezzanine Card Interfaces

The Mezzanine card attaches to the blade using a press feed connector which connects both the InfiniBand and PCI Express interfaces.

4.1 InfiniBand Interface

The ConnectX™ IB (MT25408) device is compliant with the *InfiniBand Architecture Specification, Release 1.2*. It has two compliant 4X InfiniBand ports, ports 1 and 2, each having four Tx/Rx pairs of SerDes. The mezzanine card based on this device provides access to these ports through a board to board press feed connector.

4.2 PCI Express Interface

The MDI mezzanine card has eight Tx/Rx pairs of SerDes providing for a PCI Express x8 interface, version 2.0 compliant and compatible with base 1.1 chipsets. The device can be either a master initiating the PCI Express bus operations or a slave responding to PCI bus operations.

4.3 Memory

The mezzanine card supports multiple memory devices through the PCI Express, Flash, and I2C-compatible interfaces.

4.3.1 System Memory

The mezzanine card utilizes the PCI Express interface to store and access IB fabric connection information on the system memory.

4.3.2 Flash

The mezzanine card includes two 2MB SPI Flash devices (P/N M25P16-VME6G by ST Microelectronics) accessible via the Flash interface of the MT25408 ConnectX IB device.

4.3.2.1 Jumper Configuration

There is a jumper on each mezzanine card that indicates to the device whether an on-board Flash device exists (or is to be used). Table 6 provides information on this jumper. See Figure A.1 on page 15 for the jumper location.

4.3.3 VPD EEPROM

Each board incorporates an EEPROM that is accessible through the I2C-compatible interface. The EEPROM is used for storing the Vital Product Data (VPD). The VPD format adheres to the *PCI Local Bus specification rev 2.3* VPD definition. The EEPROM capacity is 512 bytes.

Table 5- MDI VPD Information

Offset (Decimal)	Item	Value	Format	Description
0	Large Resource Type ID String Tag (0x02)	0x82		
1	Length	0x7		
3	Data	"IB Mezz"	Alphanumeric	Short description / ID
10	Large Resource Type VPD-R Tag (0x10)	0x90		Read Only Area
11	Length	0x3F		
13	VPD Keyword	"PN"	Numbers	Add in Card Part Number
15	Length	0x6		
16	Data	"0HX271"		
22	VPD Keyword	"EC"	Alphanumeric	Engineering Change Level of the card (rev)
24	Length	0x3		
25	Data	"X02"		PCB revision
28	VPD Keyword	"SN"	Alphanumeric	Serial Number
30	Length	0x14		
31	Data	"OO0HX271MMMMMYMDSSSS"		according to the board label
51	VPD Keyword	"V0"		Misc Information
53	Length	0x12		
54	Data	"20 Gb/s Mezzanine card"		
72	VPD Keyword	"RV"		
74	Length	0x1		
75	Data	Checksum		
76	Large Resource Type VPD-W Tag (0x11)	0x91		Read / Write Area
77	Length	0xB0		
79	VPD Keyword	"V1"		Driver version
81	Length	0x6		
82	Data	"N/A"	Number	
88	VPD Keyword	"YA"		Asset Tag
90	Length	0x20		
91	Data	"N/A"	Alphanumeric	

Table 5- MDI VPD Information (Continued)

Offset (Decimal)	Item	Value	Format	Description
123	VPD Keyword	“RW”		Remaining read/write area
125	Length	0x81		
126	Data	Reserved (0x00)		
255	Small Resource Type END Tag (0x11)	0x78		
256	Mellanox Read Only Mask	0x0....0	Numbers	
335	Mellanox Read/Write Mask	0x1...1	Numbers	
511	Mellanox Read Only Mask	0x0	Numbers	

4.3.4 FRU (Field Replacement Unit) EEPROM

The FRU is used by chassis management for identifying the mezzannine card.

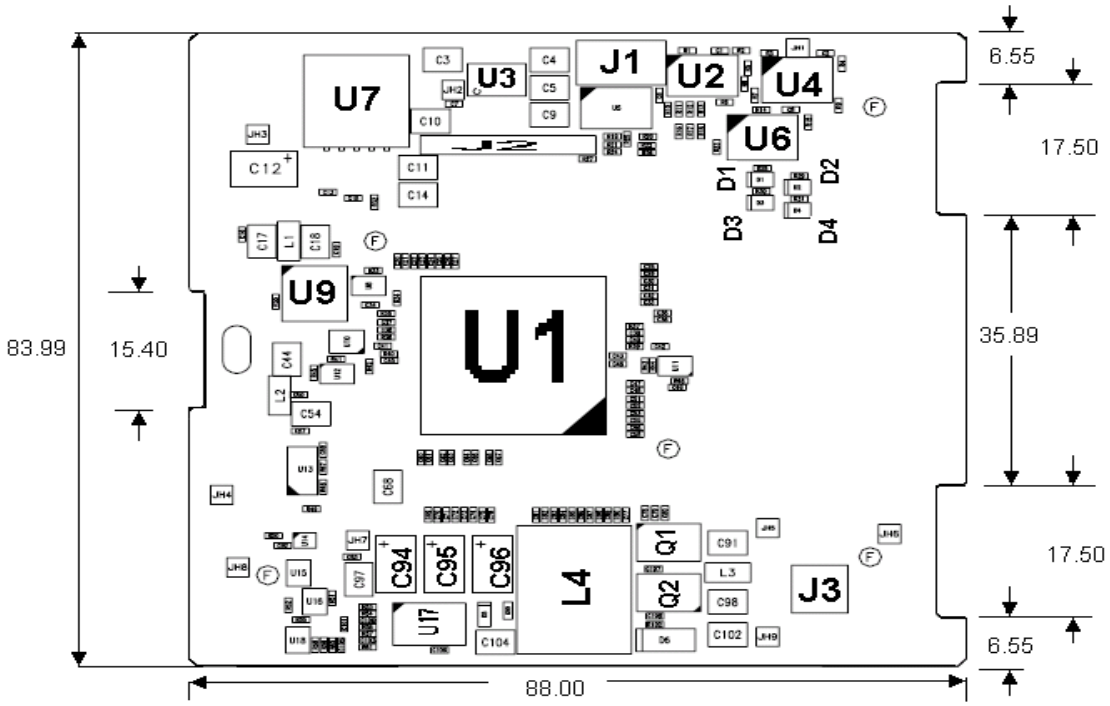
Appendix A: Specifications

A.1 Board Mechanical Drawing and Dimensions

The ConnectX IB MDI mezzanine card mechanical drawing is depicted in Figure 1.

Note: All dimensions are in millimeters.

Figure 1: ConnectX IB MDI Mezzanine Card



J1 is the I2C Connector.

A.2 EMC Certification Statements

A.2.1 FCC Statements (USA)

Class A Statements:

§ 15.21

Statement

Warning! Changes or modifications to this equipment not expressly approved by the party responsible for compliance (Mellanox Technologies) could void the user's authority to operate the equipment.

§15.105(a)

Statement

NOTE: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

A.2.2 EN Statements (Europe)

EN55022 Class A Statement:

Warning

This is a class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

A.2.3 ICES Statements (Canada)

Class A Statement:

"This Class A digital apparatus complies with Canadian ICES-003.
Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada."

A.2.4 VCCI Statements (Japan)

Class A Statement:

この装置は、情報処理装置等電波障害自主規制協議会（ＶＣＣＩ）の基準に基づくクラスＡ情報技術装置です。この装置を家庭環境で使用すると電波妨害を引き起こすことがあります。この場合には使用者が適切な対策を講ずるよう要求されることがあります。

(Translation - "This is a Class A product based on the standard of the Voluntary Control Council for Interference by Information Technology Equipment (VCCI). If this equipment is used in a domestic environment, radio interference may occur, in which case the user may be required to take corrective actions.")

A.2.5 MIC Notice (Republic of Korea Only)

The MIC label may be located separately from the other regulatory markings applied to your product.

Class A devices are for business purposes.

Class A Device

기 종 별	사 용 자 안 내 문
A급 기기 (업무용 정보통신기기)	이 기기는 업무용으로 전자파적합등록을 한 기기이오니 판매자 또는 사용자는 이 점을 주의하시기 바라며 만약 잘못 판매 또는 구입하였을 때에는 가정용으로 교환하시기 바랍니다.

MIC Class A Regulatory Label

If the regulatory label includes the following marking, your device is a Class A product:

1. 기기의 명칭(모델명):
2. 인증번호:(A)
3. 인증받은 자의 상호:
4. 제조년월일:
5. 제조자/제조국가:

A.3 Specifications

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Table 6 - MDI Specifications

Physical		**Power and Environmental**	
Size:	88.00mm X 83.99 mm	Voltage: Maximum Power: Temperature:	12V, 3.3V 12.5W 0°C to 55°C
Protocol Support		**Regulatory**	
InfiniBand: QoS: RDMA Support: Data Rate: PCI Express	IBTA v1.2, Auto-Negotiation 5.0Gb/s, 2.5Gb/s 8 InfiniBand Virtual Lanes for each port Yes, All Ports DDR Base 2.0 compliant, backwards compatible with 1.1	**Safety** **EMC (Emissions)**	EUC60905 – USA: FCC, Class A –Canada: ICES, Class A – EU: CE Mark (EN55022 Class A, EN50024, EN61000-3-2, EN61000-3-3) –Japan: VCCI, Class A –Korea: MIC Class A –Austraila/ New Zealand: C-Tick Class A